REMARKS

The Office Action of April 10, 2006 has been carefully studied. The claims in the case are now claims 1-31 with the fee for new claims 26-31 being attached herewith. No claim has yet to be allowed.

The following paragraphs correspond to the order of the paragraphs of the Office Action:

Specification

The oxidation of dibenzothiophenes into sulfones is now set forth on page 4. A reference for such a reaction can be found for example in "Chimie Organique" by Cram and Hammond published in 1963 at University of Laval Presses (Quebec) page 472.

Claim Rejections - 35 U.S.C. 102(b)

Although original claims 1-11 and 13-25 were rejected under 35 U.S.C. 102(b) as being anticipated by Yoo et al. (U.S. 3,945,914), a close inspection of the reference reveals that Applicants' original claims, much less the newly added claims are not properly rejected as lacking novelty. In particular, Applicants' catalyst is specified as being in bulk form and wherein the metal of the metallic oxide catalyst is from groups IV-B, V-B or VI-B of the periodic table.

In the reference, column 6, lines 21-24 is relied on for the statement that the molybdenum metal useful in the preparation of the particularly preferred molybdenum-containing catalyst may be in the form of lumps, sheets, foil or powder. However, a review of column 6, lines 24-43 reveals that these materials are used in a reaction which solubilizes them. Note line 29 wherein it is indicated that the finally divided powder material offers the "fastest rate of solubilization" and lines 39-41 that the reaction mass is filtered to separate insoluble molybdenum from the catalyst mixture which catalyst is thereafter suitable as a catalyst for the oxidation of sulfur impurities and hydrocarbon materials. Since the insoluble molybdenum is filtered, it is clear that the catalyst mixture is a solution, i.e. a homogeneous catalyst.

As for the remainder of the teachings of the reference, it is seen that two reaction steps are required:

1. Contacting the sulfur-containing hydrocarbon with an oxidant optionally in the presence of a metal-containing catalyst to preferentially oxidize at least a portion of the sulfur and form an oxidized sulfur-containing hydrocarbon material; and

2. Contacting a resultant sulfur-containing hydrocarbon material from the first step with at least one additional metal-containing component at a temperature within the range from 500°F to 1350°F, preferably 650°F to about 1000°F, more preferably 700°F to about 850°F, to form a metal-containing component comprising a metal selected from the group consisting of nickel, molybdenum, cobalt, tungsten, iron, zinc, vanadium, manganese, mercury and mixtures thereof.

In comparison, Applicants' process can be conducted in a single stage as demonstrated in Examples 1 and 4 and specifically claimed in amended claims 21 and 22. Claim 21 is also dependent on new claim 31 which is in turn dependent on new claim 29, resulting in a process wherein the sulfur compounds comprise at least one of benzothiophene and dibenzothiophene and which are oxidized to the corresponding sulfones and sulfoxides, and wherein the catalyst is bulk molybdenum oxide.

It is also noted that the examples of the patent utilize hydrogen to maintain high pressures in a closed vessel. Such a system is not contemplated in Applicants' invention, and is seen from Applicants' title, an advantage of Applicant's invention resides in avoiding the consumption of hydrogen, and this advantage is set forth in Applicants' amended claims 5 and 11.

As for step 2 of the reference, a discussion is provided on column 7, lines 49-52, and examples of homogeneous catalysts, starting on column 9, line 60, heterogeneous catalysts starting on column 10, line 8, and iron oxide, starting on column 10, line 42, but these catalysts do not suggest Applicants' particular bulk catalyst of oxides from IV-B, V-B or VI-B. As stated on column 10, lines 59-64 of the reference, the heterogeneous molybdenum oxide catalyst, supported on silica, and iron oxide resulted in a significant improvement in the degree of desulfurization as a second step in the patented process, noting that the heterogeneous catalyst provided a desulfurization of 84% and the iron oxide resulted in a desulfurization of 79% which would lead one of ordinary skill to employ the heterogeneous catalyst, and certainly not Applicants' bulk catalyst of oxides from IV-B, V-B or VI-B.

There also is no mention of sulfur compounds containing benzothiophene or dibenzothiophene which are specifically set forth in Applicants' claims 29, 30 and 31. It is only necessary to view Applicants' Examples 1 and 4 wherein Applicants' process resulted in a complete desulfurization of such compounds.

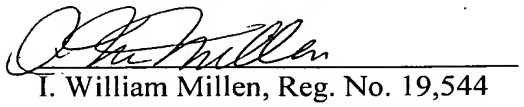
Finally, it is seen that Applicants' new claims 26-28 require that the bulk form consists essentially of at least 70%, 90% or 98% of the metallic oxide, respectively, thereby emphasizing the bulk nature of Applicants' catalyst, support being found on page 2, third paragraph from the bottom of Applicants' specification. Still other claims require that the oxidation be conducted at below 200°C, support being found on page 2, second paragraph from the bottom. This upper temperature of 200°C is significantly lower than the minimum temperatures set forth in the reference for step 2.

In summation, the reference does not suggest Applicants' invention regarding the conducting of a process without the consumption of hydrogen and the use of a bulk catalyst of a metal oxide from groups IV-B, V-B and VI-B, and much less does the reference contemplate the features set forth in Applicants' dependent claims, such as new claims 29-31 and amended claims 21 and 22 which stipulate that the oxidation is conducted in a single oxidation stage, which flies in the face of the teachings of the reference.

In view of the above remarks, favorable reconsideration is courteously requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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